

ABSTRACT OF THE DISCLOSURE**METHOD AND SYSTEM FOR ENERGY MANAGEMENT IN A SIMULTANEOUS MULTI-
THREADED (SMT) PROCESSING SYSTEM INCLUDING PER-THREAD DEVICE
USAGE MONITORING**

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A method and system for energy management in a simultaneous multi-threaded (SMT) processing system including per-thread device usage monitoring provides control of energy usage that accommodates thread parallelism. Per-device usage information is measured and stored on a per-thread basis, so that upon a context switch, the previous usage evaluation state can be restored. The per-thread usage information is used to adjust the thresholds of device energy management decision control logic, so that energy use can be managed with consideration as to which threads will be running in a given execution slice. A device controller can then provide for per-thread control of attached device power management states without intervention by the processor and without losing the historical evaluation state when a process is switched out. The device controller may be a memory controller and the controlled devices memory modules or banks within modules if individual banks can be power-managed. Local thresholds provide the decision-making mechanism for each controlled device and are adjusted by the operating system in conformity with the measured usage level for threads executing within the processing system. The per-thread usage information may be obtained from a performance monitoring unit that is located within or external to the device controller and the usage monitoring state is then retrieved and replaced by the operating system at each context switch.